

Technical Direction (Amended)
National Watershed Contract
EP-C-08-002
Task Order 25

Task:

Subtask 1: TMDL Development Support

Title:

HSPF Hydrologic Modeling Calibration for the Bacterial Impairment in Elk Creek, Oregon

Date of Technical Direction Discussion or Issuance: December 2011, Updated in June 2012 to add subtask #15, Updated March 2013 to add subtask #16.

Estimated Level of Effort: Up to 390 hrs of the currently approved LOE hours in Task Order 25 should be utilized to complete the Technical Direction (TD) with 20 additional hours for subtask #15 and no more than 100 hours additional hours for subtask #16.

Description and Purpose (General):

The Contractor will conduct the hydrologic calibration of the HSPF model for the bacteria impairment in Big Elk Creek within the Mid-Coast Basin in Oregon.

Background, Tasks and Deliverables:

Background

The Oregon Department of Environmental Quality (DEQ) made recent commitments to complete and submit "Implementation-Ready" TMDLs (also known as prescriptive TMDLs) and TMDL Implementation Plans for the Midcoast Basin by June 30, 2012. These commitments were made to address Oregon's Coastal Nonpoint Pollution Control Program (CNPCP) Approval and Settlement Agreement Requirements.

One of the impairments is bacteria in Elk Creek. DEQ will be conducting HSPF hydrologic modeling for Big Elk Creek and the results will be used to develop to make the TMDL more implementation ready. A key component of modeling is calibration. One of the major challenges is the lack of stream flow data. This TD focuses on the calibration of the HSPF hydrologic model including formulating an approach to calibrate the model, given the lack of stream flow data. The Contractor will use PEST for calibration and uncertainty analysis to get good estimates of error variance of the parameter estimates.

Tasks

1. Hold conference call with Team (shown under "contacts" section of this TD) to clarify the tasks under this technical direction and obtain all key documents. Develop summary of key decisions and actions from the call and distribute to the Team. Set up FTP site for exchange of information.
2. Compile and inventory available meteorological and flow data.
3. Develop draft calibration approach and distribute to the Team.

4. Hold conference call with Team to discuss the draft calibration approach. Develop summary of key decisions and actions from the call and distribute to the Team.
5. Address Team's comments received during the call and in writing. Revise calibration approach and distribute document and response to comments to the Team.
6. Create WDM files for meteorological and flow data.
7. Develop HSPF input from available spatial data.
8. Calibrate model using PEST.
9. Conduct uncertainty analysis using PEST.
10. Organize calibrated model, WDM files, GIS data, PEST files, and any intermediate files and deliver to DEQ.
11. Create draft methods and results report and distribute to the Team.
12. Hold conference call with the Team to discuss results and draft report. Develop summary of key decisions and actions from the call.
13. Address Team's comments and finalize the report and distribute document and response to comments to the Team.
14. Address any follow-up questions on calibration from the Team within 30 days from completion of the report for up to 2 LOE hours.
15. Add the criterion that the baseflow index for the simulation is equal to 0.44. The simulated baseflow index can be calculated as the ratio of the simulated baseflow volume and simulated total flow volume from all the PLSs. Then rerun the calibration. This subtask involves revising the model files, re-running the uncertainty analysis, revising the final report, and providing the DEQ with all of the files, including the new calibrated parameter set.
16. Assist in the setup, management, and running of water quality model calibration using source-models, HSPF, and PEST for the Big Elk Creek Bacteria TMDL. The water quality model being used in the Big Elk Creek Bacteria TMDL is a hybrid of standalone source models that feed input to the Watershed model HSPF. When PEST is used to calibrate this hybrid-model, batch files will need to be created to manage the running and linking of the sub-models to HSPF. Template files for the source models that are used by PEST will also need to be created. Several utility programs from PEST will be needed to process model output for use in the objective functions. The input files for the utility programs will need to be created. The last component will be the development of the PEST control file for the calibration. The specific tasks to be conducted only include the preliminary tasks in calibrating the model listed above. R programming experience is necessary for this work because the sub-models are coded in R.

Deliverables and Schedule

Task	Deliverable	Date
Hold conference call on draft technical direction and set up FTP site.	Summary of key decisions and actions FTP site	Call: 1/5/12 Summary and FTP Site: 1/9/12
Develop draft calibration approach	Draft calibration approach including data inventory summary table	1/13/12
EPA/DEQ submit comments on draft approach Conduct conference call on calibration approach if needed	Summary of key decisions and actions	Comments due: 1/18/12 Call: 1/19/12 Call summary: 1/24/12
Revise calibration approach based on comments received from Team during call and in writing	Final calibration approach Response to comments (as separate document or as tracked version)	1/25/12
Conduct Tasks 6-9	Emails/memos detailing progress	Task 6: Submittal: 1/30/12 EPA/DEQ Comments: 1/31/12. Task 7: Submittal: 2/6/12 EPA/DEQ Comments: 2/7/12. Task 8: Submittal: 2/17/12 EPA/DEQ Comments: 2/21/12. Task 9: Submittal: 2/29/12 EPA/DEQ Comments: 3/1/12.
Conduct conference calls on Tasks 6-9 if needed	Summary of key decisions and actions if needed	Task 6 Call: 2/1/12 Task 7 Call: 2/8/12 Task 8 Call: 2/22/12 Task 9 Call: 3/2/12 Summaries with 3 working days from call if needed.
Develop draft methods and results document	Draft document on methods and results	3/9/12
Hold conference call on draft methods and results document	Summary of key decisions and actions	EPA/DEQ comments due: 3/12/12 Call: 3/13/12 Summary: 3/16/12
Revise draft methods and results document based on comments received from Team	Final Report Response to comments (as separate document or as tracked version)	3/19/12
Deliver calibrated model, WDM files, GIS data, PEST files, and any intermediate files to DEQ.	Files	3/19/12
Revised Final Report and delivery of all files including the new calibrated parameter set	Final revised report Files	Mid July 2012
Develop draft calibration approach for water quality model calibration using source-models, HSPF, and	Draft calibration approach including data inventory summary table Final calibration	April 2013

PEST for the Big Elk Creek Bacteria TMDL. Respond to team's comments and revise approach.	approach.	
Hold conference call to clarify additional task in technical direction and draft calibration approach.	Summary of key decisions	Call: 4/3/13 Summary: Within 5 working days from call.
Deliver files pertaining to preliminary tasks in calibrating the model and summarize work completed on this project including any challenges and recommendations. Hold conference call, if requested by TOM	Files Report Summary of key decisions	No later than April 30, 2013.

As the EPA TOM, I have considered the sensitivity of any information generated by this TD.

The following applies:

☒ I have no reason to believe that any sensitive information will be generated as part of this TD

☐ I have reason to believe that sensitive information will be generated as part of this TD. The following safeguard measures shall be implemented: N/A

☒ This TD does not include additional work outside the scope of the task order.

☒ This TD will not cause an increase or decrease in the estimated cost of the task order.

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